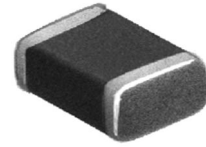




MULTILAYER CERAMIC CHIP CAPACITORS

THC Series / TMC Series (High Reliability)



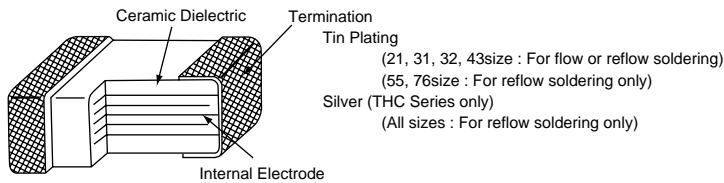
◆FEATURES

1. Small size and large capacitance, high ripple current.
2. Temperature characteristic is Y5U in EIA code.
3. Superior humidity characteristic and long life.
4. Excellent noise absorption.

◆APPLICATIONS

1. Smoothing circuit of small size DC-DC converter.
2. On-board power supply.
3. Noise suppressor for various kinds of equipments.
4. By-pass or decoupling circuits.

◆CONSTRUCTION



◆RATINGS

| | |
|--------------------------------|---------------------------------|
| 1. Category Temperature Range | -55 to +125°C |
| 2. Rated Voltage Range | 25, 50, 100, 200V _{dc} |
| 3. Rated Capacitance Range | 0.047 to 47μF |
| 4. Rated Capacitance Tolerance | M (±20%) , Z (±20%) |
| 5. Temperature Characteristics | E (JIS) ≒ Y5U (EIA) |
| 6. Rated Ripple Current | See No.5 on the following table |

◆SPECIFICATIONS

| No. | Items | Specification | Test Condition | | | | | | | | | | | | | | |
|-----------|-----------------------|--|---|-----|-----|-----|----|----|----|------|-----|-----|-----|-----|-----|-----|--|
| 1 | Withstand Voltage | No abnormality. | 250% of rated voltage shall be applied for 5 seconds. | | | | | | | | | | | | | | |
| 2 | Insulation Resistance | 1000/C _R (MΩ) or 10000(MΩ) whichever is less. | Rated voltage shall be applied for 60±5 seconds at temperature 20±2°C. | | | | | | | | | | | | | | |
| 3 | Rated Capacitance | Within specified tolerance. | Temperature : 20±2°C Frequency : 1±0.1kHz Voltage : 1±0.2V _{rms} | | | | | | | | | | | | | | |
| 4 | Dissipation Factor | 5.0% maximum. | Temperature : 20±2°C Frequency : 1±0.1kHz Voltage : 1±0.2V _{rms} | | | | | | | | | | | | | | |
| 5 | Rated Ripple Current | <table border="1"> <tr> <td>Size code</td> <td>21</td> <td>31</td> <td>32</td> <td>43</td> <td>55</td> <td>76</td> </tr> <tr> <td>Arms</td> <td>0.2</td> <td>0.3</td> <td>0.5</td> <td>1.0</td> <td>2.0</td> <td>3.0</td> </tr> </table> | Size code | 21 | 31 | 32 | 43 | 55 | 76 | Arms | 0.2 | 0.3 | 0.5 | 1.0 | 2.0 | 3.0 | 10kHz~1MHz (sine curve) Ripple voltage V _p shall be less than the rated voltage. |
| Size code | 21 | 31 | 32 | 43 | 55 | 76 | | | | | | | | | | | |
| Arms | 0.2 | 0.3 | 0.5 | 1.0 | 2.0 | 3.0 | | | | | | | | | | | |

◆SPECIFICATIONS

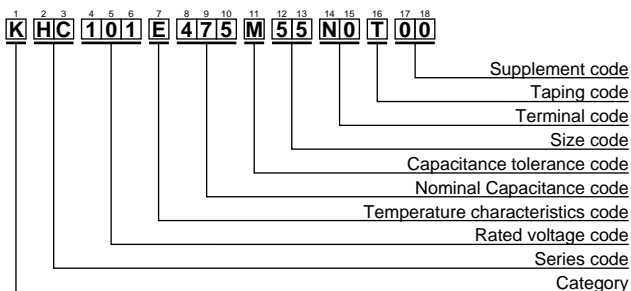
| No. | Items | Specification | Test Condition | | | | | | | | | | | | | | | |
|--------------------|-----------------------------------|--|---|--------|------------------|----------|--------------------|------------------------------|---------|--------------|------------------|--------|---|------------------------------|------|---|------------------|--------|
| 6 | Adhesion | No visible damage. | <p>Substrate 5N (0.51kgf) for 10±1 seconds Capacitor</p> | | | | | | | | | | | | | | | |
| 7 | Bend strength of the face plating | Appearance : No visible damage. $\Delta C/C : \pm 15\%$ | <p>The substrate shall be bend by 1mm at a rate of 1mm/s for 5 seconds.</p> <p>Press Press bar Capacitor Substrate 1.0mm Support 45±2mm 45±2mm</p> | | | | | | | | | | | | | | | |
| 8 | Solderability | Min. 75% of surface of the termination shall be covered with new solder | <table border="1"> <thead> <tr> <th>Solder</th> <th>Pb Free</th> <th>Eutectic</th> </tr> </thead> <tbody> <tr> <td>Solder Temperature</td> <td>245±5°C</td> <td>235±5°C</td> </tr> <tr> <td>Dipping Time</td> <td colspan="2">2±0.5sec.</td> </tr> </tbody> </table> | Solder | Pb Free | Eutectic | Solder Temperature | 245±5°C | 235±5°C | Dipping Time | 2±0.5sec. | | | | | | | |
| Solder | Pb Free | Eutectic | | | | | | | | | | | | | | | | |
| Solder Temperature | 245±5°C | 235±5°C | | | | | | | | | | | | | | | | |
| Dipping Time | 2±0.5sec. | | | | | | | | | | | | | | | | | |
| 9 | Resistance to Soldering Heat | Appearance : No visible damage. $\Delta C/C : \pm 15\%$ D.F. : To meet the initial specification. I.R. : To meet the initial specification. | <p>Solder Temperature : 260±5°C Dipping Time : 2±0.5 seconds</p> | | | | | | | | | | | | | | | |
| 10 | Temperature Cycle | Appearance : No visible damage. $\Delta C/C : \pm 15\%$ D.F. : To meet the initial specification. I.R. : To meet the initial specification. | <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>(min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Min. Category temperature ±3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>3 max.</td> </tr> <tr> <td>3</td> <td>Max. Category temperature ±3</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>3 max.</td> </tr> </tbody> </table> <p><Cycle> THC series : 5 cycles TMC series : 100 cycles</p> | Step | Temperature (°C) | (min.) | 1 | Min. Category temperature ±3 | 30±3 | 2 | Room temperature | 3 max. | 3 | Max. Category temperature ±3 | 30±3 | 4 | Room temperature | 3 max. |
| Step | Temperature (°C) | (min.) | | | | | | | | | | | | | | | | |
| 1 | Min. Category temperature ±3 | 30±3 | | | | | | | | | | | | | | | | |
| 2 | Room temperature | 3 max. | | | | | | | | | | | | | | | | |
| 3 | Max. Category temperature ±3 | 30±3 | | | | | | | | | | | | | | | | |
| 4 | Room temperature | 3 max. | | | | | | | | | | | | | | | | |
| 11 | Humidity Load Life | Appearance : No abnormality. $\Delta C/C : \pm 20\%$ D.F. : 7% maximum I.R. : 50/C _R (MΩ) or 1000(MΩ) whichever is less. | <p>Temperature : 40±2°C Humidity : 90 to 95%RH Voltage : Rated voltage Time : 500±²⁴₀hours</p> | | | | | | | | | | | | | | | |
| 12 | Endurance | Appearance : No abnormality. $\Delta C/C : \pm 20\%$ D.F. : 7% maximum I.R. : 100/C _R (MΩ) or 1000(MΩ) whichever is less. | <p>Temperature : 85±2°C Voltage : 200% of rated voltage. Time : 1000±⁴⁸₀hours</p> | | | | | | | | | | | | | | | |
| | | | <p>Temperature : 125±3°C Voltage : Rated voltage Time : 1000±⁴⁸₀hours</p> | | | | | | | | | | | | | | | |

*C_R : Rated Capacitance(μF)

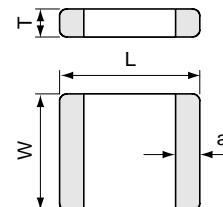
◆STANDARD RATINGS

| Rated voltage (Vdc) | Rated Capacitance (μF) | Dimensions(mm) | | | | Maximum ripple current (Arms) | Part Number | Previous Part Number (Just for your reference) | |
|---------------------|------------------------|----------------|----------|--------------------|---------|-------------------------------|--------------------|--|-----------------|
| | | L | W | Tmax. | a | | | | |
| 25 | 0.33 | 2.0±0.2 | 1.25±0.2 | 1.25 | 0.3±0.2 | 0.2 | KHC250E334M21N0T00 | THCS20E1E334MTF | |
| | 0.47 | | | | | | KHC250E474M21N0T00 | THCS20E1E474MTF | |
| | 0.68 | | | | | | KHC250E684M21N0T00 | THCS20E1E684MTF | |
| | 1.0 | 3.2±0.2 | 1.6±0.2 | 1.6 | 0.5±0.3 | 0.3 | KHC250E105M31N0T00 | THCS30E1E105MTF | |
| | 1.5 | | | | | | KHC250E155M31N0T00 | THCS30E1E155MTF | |
| | 2.2 | | | | | | KHC250E225M31N0T00 | THCS30E1E225MTF | |
| | 3.3 | 3.2±0.2 | 2.5±0.2 | 2.0 | 0.6±0.3 | 0.5 | KHC250E335M32N0T00 | THCS40E1E335MTF | |
| | 4.7 | | | | | | KHC250E475M32N0T00 | THCS40E1E475MTF | |
| | 6.8 | | | | | | KHC250E685M43N0T00 | THCS50E1E685MTF | |
| | 10 | 4.5±0.3 | 3.2±0.2 | 2.2 | 0.6±0.3 | 1.0 | KHC250E106M43N0T00 | THCS50E1E106MTF | |
| | 15 | | | 3.0 | | | KHC250E156M43N0T00 | THCS50E1E156MTF | |
| | 22 | | | 2.2 | | | KHC250E226M55N0T00 | THCS60E1E226MTF | |
| | 33 | 5.7±0.4 | 5.0±0.4 | 3.0 | 0.8±0.5 | 2.0 | KHC250E336M55N0T00 | THCS60E1E336MTF | |
| | 47 | | | 3.0 | | | KHC250E476M76N0T00 | THCS70E1E476MTF | |
| 6.8 | 2.2 | | | KHC250E685M55N0T00 | | | THCS60E1H685MTF | | |
| 50 | 0.1 | 2.0±0.2 | 1.25±0.2 | 1.25 | 0.3±0.2 | 0.2 | KHC500E104M21N0T00 | THCS20E1H104MTF | |
| | 0.15 | | | | | | KHC500E154M21N0T00 | THCS20E1H154MTF | |
| | 0.22 | | | | | | KHC500E224M21N0T00 | THCS20E1H224MTF | |
| | 0.33 | 3.2±0.2 | 1.6±0.2 | 1.6 | 0.5±0.3 | 0.3 | KHC500E334M31N0T00 | THCS30E1H334MTF | |
| | 0.47 | | | | | | KHC500E474M31N0T00 | THCS30E1H474MTF | |
| | 0.68 | | | | | | KHC500E684M31N0T00 | THCS30E1H684MTF | |
| | 1.0 | 3.2±0.2 | 2.5±0.2 | 2.0 | 0.6±0.3 | 0.5 | KHC500E105M32N0T00 | THCS40E1H105MTF | |
| | 1.5 | | | | | | KHC500E155M32N0T00 | THCS40E1H155MTF | |
| | 2.2 | | | | | | KHC500E225M32N0T00 | THCS40E1H225MTF | |
| | 3.3 | 4.5±0.3 | 3.2±0.2 | 2.2 | 0.6±0.3 | 1.0 | KHC500E335M43N0T00 | THCS50E1H335MTF | |
| | 4.7 | | | 3.0 | | | KHC500E475M43N0T00 | THCS50E1H475MTF | |
| | 6.8 | | | 2.2 | | | KHC500E685M55N0T00 | THCS60E1H685MTF | |
| | 10 | 5.7±0.4 | 5.0±0.4 | 3.0 | 0.8±0.5 | 2.0 | KHC500E106M55N0T00 | THCS60E1H106MTF | |
| | 15 | | | 3.0 | | | KHC500E156M55N0T00 | THCS60E1H156MTF | |
| 22 | 2.2 | | | KHC500E226M76N0T00 | | | THCS70E1H226MTF | | |
| 100 | 0.047 | 2.0±0.2 | 1.25±0.2 | 1.25 | 0.3±0.2 | 0.2 | KHC101E473M21N0T00 | THCS20E2A473MTF | |
| | 0.068 | | | | | | KHC101E683M21N0T00 | THCS20E2A683MTF | |
| | 0.1 | | | | | | KHC101E104M31N0T00 | THCS30E2A104MTF | |
| | 0.15 | 3.2±0.2 | 1.6±0.2 | 1.6 | 0.5±0.3 | 0.3 | KHC101E154M31N0T00 | THCS30E2A154MTF | |
| | 0.22 | | | | | | KHC101E224M31N0T00 | THCS30E2A224MTF | |
| | 0.33 | | | | | | KHC101E334M32N0T00 | THCS40E2A334MTF | |
| | 0.47 | 3.2±0.2 | 2.5±0.2 | 2.0 | 0.6±0.3 | 0.5 | KHC101E474M32N0T00 | THCS40E2A474MTF | |
| | 0.68 | | | | | | 2.5 | KHC101E684M32N0T00 | THCS40E2A684MTF |
| | 1.0 | | | | | | KHC101E105M43N0T00 | THCS50E2A105MTF | |
| | 1.5 | 4.5±0.3 | 3.2±0.2 | 2.2 | 0.6±0.3 | 1.0 | KHC101E155M43N0T00 | THCS50E2A155MTF | |
| | 2.2 | | | 3.0 | | | KHC101E225M43N0T00 | THCS50E2A225MTF | |
| | 3.3 | | | 2.2 | | | KHC101E335M55N0T00 | THCS60E2A335MTF | |
| | 4.7 | 5.7±0.4 | 5.0±0.4 | 3.0 | 0.8±0.5 | 2.0 | KHC101E475M55N0T00 | THCS60E2A475MTF | |
| | 6.8 | | | 3.0 | | | KHC101E685M76N0T00 | THCS70E2A685MTF | |
| 6.8 | 2.2 | | | KHC101E685M76N0T00 | | | THCS70E2A685MTF | | |
| 200 | 0.047 | 3.2±0.2 | 1.6±0.2 | 1.6 | 0.5±0.3 | 0.3 | KHC201E473M31N0T00 | THCS30E2D473MTF | |
| | 0.068 | | | | | | KHC201E683M31N0T00 | THCS30E2D683MTF | |
| | 0.1 | | | | | | KHC201E104M32N0T00 | THCS40E2D104MTF | |
| | 0.15 | 3.2±0.2 | 2.5±0.2 | 2.0 | 0.6±0.3 | 0.5 | KHC201E154M32N0T00 | THCS40E2D154MTF | |
| | 0.22 | | | | | | 2.5 | KHC201E224M32N0T00 | THCS40E2D224MTF |
| | 0.33 | | | | | | 2.2 | KHC201E334M43N0T00 | THCS50E2D334MTF |
| | 0.47 | 4.5±0.3 | 3.2±0.2 | 3.0 | 0.6±0.3 | 1.0 | KHC201E474M43N0T00 | THCS50E2D474MTF | |
| | 0.68 | | | 2.2 | | | KHC201E684M55N0T00 | THCS60E2D684MTF | |
| | 1.0 | | | 3.0 | | | KHC201E105M55N0T00 | THCS60E2D105MTF | |
| | 1.5 | 5.7±0.4 | 5.0±0.4 | 2.5 | 0.8±0.5 | 2.0 | KHC201E475M55N0T00 | THCS60E2A475MTF | |
| | 2.2 | | | 3.0 | | | KHC201E155M76N0T00 | THCS70E2D155MTF | |
| | 2.2 | | | 2.2 | | | KHC201E225M76N0T00 | THCS70E2D225MTF | |

◆PART NUMBERING SYSTEM



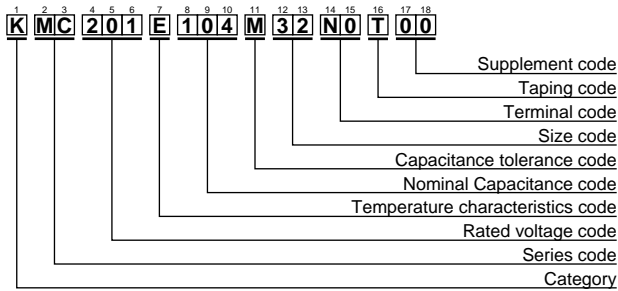
◆DIMENSIONS



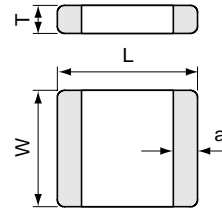
◆STANDARD RATINGS

| Rated voltage (Vdc) | Rated Capacitance (μF) | Dimensions(mm) | | | | Maximum ripple current (Arms) | Part Number | Previous Part Number (Just for your reference) | |
|---------------------|------------------------|----------------|---------|-------|---------|-------------------------------|--------------------|--|-----------------|
| | | L | W | Tmax. | a | | | | |
| 25 | 0.68 | 3.2±0.2 | 1.6±0.2 | 1.6 | 0.4±0.2 | 0.3 | KMC250E684M31N0T00 | TMCS30E1E684MTF | |
| | 1 | | | | | | KMC250E105M31N0T00 | TMCS30E1E105MTF | |
| | 1.5 | | | | | | KMC250E155M31N0T00 | TMCS30E1E155MTF | |
| | 2.2 | | | | | | KMC250E225M32N0T00 | TMCS40E1E225MTF | |
| | 3.3 | 4.5±0.3 | 3.2±0.2 | 2.2 | 0.5±0.2 | | 0.5 | KMC250E335M32N0T00 | TMCS40E1E335MTF |
| | 4.7 | | | | | | | KMC250E475M43N0T00 | TMCS50E1E475MTF |
| | 6.8 | | | | | | | KMC250E685M43N0T00 | TMCS50E1E685MTF |
| | 10 | | | | | | | KMC250E106M43N0T00 | TMCS50E1E106MTF |
| 50 | 0.33 | 3.2±0.2 | 1.6±0.2 | 1.6 | 0.4±0.2 | 0.3 | | KMC500E334M31N0T00 | TMCS30E1H334MTF |
| | 0.47 | | | | | | | KMC500E474M31N0T00 | TMCS30E1H474MTF |
| | 0.68 | | | | | | | KMC500E684M32N0T00 | TMCS40E1H684MTF |
| | 1.0 | | | | | | | KMC500E105M32N0T00 | TMCS40E1H105MTF |
| | 1.5 | 4.5±0.3 | 3.2±0.2 | 2.2 | 0.5±0.2 | | 0.5 | KMC500E155M32N0T00 | TMCS40E1H155MTF |
| | 2.2 | | | | | | | KMC500E225M43N0T00 | TMCS50E1H225MTF |
| | 3.3 | | | | | | | KMC500E335M43N0T00 | TMCS50E1H335MTF |
| | 4.7 | | | | | | | KMC500E475M43N0T00 | TMCS50E1H475MTF |
| 100 | 0.1 | 3.2±0.2 | 1.6±0.2 | 1.6 | 0.4±0.2 | 0.3 | | KMC101E104M31N0T00 | TMCS30E2A104MTF |
| | 0.15 | | | | | | | KMC101E154M31N0T00 | TMCS30E2A154MTF |
| | 0.22 | | | | | | | KMC101E224M32N0T00 | TMCS40E2A224MTF |
| | 0.33 | | | | | | | KMC101E334M32N0T00 | TMCS40E2A334MTF |
| | 0.47 | 4.5±0.3 | 3.2±0.2 | 2.2 | 0.5±0.2 | | 0.5 | KMC101E474M32N0T00 | TMCS40E2A474MTF |
| | 0.68 | | | | | | | KMC101E684M43N0T00 | TMCS50E2A684MTF |
| | 1.0 | | | | | | | KMC101E105M43N0T00 | TMCS50E2A105MTF |
| | 1.5 | | | | | | | KMC101E155M43N0T00 | TMCS50E2A155MTF |
| 200 | 0.033 | 3.2±0.2 | 1.6±0.2 | 1.6 | 0.4±0.2 | 0.3 | | KMC201E333M31N0T00 | TMCS30E2D333MTF |
| | 0.047 | | | | | | | KMC201E473M31N0T00 | TMCS30E2D473MTF |
| | 0.068 | | | | | | | KMC201E683M32N0T00 | TMCS40E2D683MTF |
| | 0.1 | | | | | | | KMC201E104M32N0T00 | TMCS40E2D104MTF |
| | 0.15 | 4.5±0.3 | 3.2±0.2 | 2.2 | 0.5±0.2 | | 0.5 | KMC201E154M32N0T00 | TMCS40E2D154MTF |
| | 0.22 | | | | | | | KMC201E224M43N0T00 | TMCS50E2D224MTF |
| | 0.33 | | | | | | | KMC201E334M43N0T00 | TMCS50E2D334MTF |
| | 0.47 | | | | | | | KMC201E474M43N0T00 | TMCS50E2D474MTF |

◆PART NUMBERING SYSTEM



◆DIMENSIONS



Mouser Electronics

Authorized Distributor

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[KHC101E105Z43N0T00](#) [KHC500E225Z43R0T00](#) [KHC500E226Z76R0T00](#) [KHC101E155M43N0T00](#)
[KHC250E106Z43R0T00](#) [KHC250E106Z53N0T00](#) [KHC250E475Z32R0T00](#) [KHC500E106Z55R0T00](#)
[KHC101E474Z32N0T00](#) [KHC500E685Z55N0T00](#) [KHC101E335M55N0T00](#) [KHC101E105Z43R0T00](#)
[KHC201E155M76R0T00](#) [KHC101E475Z55N0T00](#) [KHC160E686M76N0T00](#) [KHC500E475M55R0T00](#)
[KHC250E474Z21N0T00](#) [KHC500E156M55N0T00](#) [KHC250E226Z55R0T00](#) [KHC250E685Z43N0T00](#)
[KHC101E225Z55N0T00](#) [KHC500E685M55N0T00](#) [KHC500E685M55R0T00](#) [KHC250E476M76R0T00](#)
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[KHC250E106M43R0T00](#) [KHC101E335Z55R0T00](#) [KHC101E155Z43N0T00](#) [KHC500E106Z55N0T00](#)
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[KHC250E476M76N0T00](#) [KHC500E226M76N0T00](#) [KHC500E225Z43N0T00](#) [KHC250E336Z76R0T00](#)
[KHC101E475M55R0T00](#) [KHC500E475Z55R0T00](#) [KHC101E475Z76N0T00](#) [KHC250E225Z31R0T00](#)
[KHC250E225M31N0T00](#) [KHC250E106Z43N0T00](#) [KHC101E685M76R0T00](#) [KHC101E225M43R0T00](#)
[KHC101E475Z76R0T00](#) [KHC101E475M55N0T00](#) [KHC101E685M76N0T00](#) [KHC101E475Z55R0T00+000](#)
[KHC250E226M55N0T00](#) [KHC500E335Z43N0T00](#) [KHC201E105M55N0T00](#) [KHC250E225Z31N0T00](#)
[KHC101E335Z55N0T00](#) [KHC201E225M76N0T00](#) [KHC101E225M43N0T00](#) [KHC250E334Z21R0T00](#)
[KHC500E106M55N0T00](#) [KHC201E105M55R0T00](#) [KHC250E475M32N0T00](#) [KHC500E156M55R0T00](#)
[KHC160E335M31N0T00](#) [KHC101E155Z43R0T00](#) [KHC500E335M43R0T00](#) [KHC500E226M76R0B00](#)

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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